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Case Report

Cervical necrotizing fasciitis and descending necrotizing mediastinitis in a patient affected by neglected peritonsillar abscess: A case of medical negligence

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Abstract

We report a case of fatal cervical necrotizing fasciitis (CNF) and descending necrotizing mediastinitis (DNM) due to primary peritonsillar abscess in 60-year-old male patient with no history or evidence of immunocompromising disorders.

The patient was treated with antibiotic and corticosteroid drugs but he developed mediastinitis and septic shock and died of multiple organ failure six days later from recovery in hospital.

After a clinical, diagnostic and therapeutical consideration of the cervical necrotizing fasciitis and some related risks of a delayed diagnosis and treatment, the authors analysed the clinical history of the patient and of the medical conduct pointing out professional malpractice chargeable to doctors.

Keywords: Peritonsillar abscess; Cervical necrotizing fasciitis; Descending necrotizing mediastinitis; Medical negligence; Case report

1. Introduction

Abscesses of the peritonsillar region are among the most common deep abscesses of the head and the neck. Causative organism include mixed aerobes and anaerobes, most commonly *Streptococcus* spp., *Staphylococcus* spp., *Bacteroides* spp., *Fusobacterium* spp. and *Peptostreptococcus* spp. although a mixture of facultative and anaerobic bacteria could also lead to this type of infection.[1]

One of the most dangerous complication is cervical necrotizing fasciitis (CNF), an uncommon, rather fatal, rapidly progressive polymicrobial infection of the soft tissue. This infection is characterized by widespread necrosis of the superficial and deep fascia, subcutaneous fat and muscles. This condition is associated with extreme systemic toxicity.[2–4]

The current term "Necrotizing Fasciitis" (NF) was first used by Wilson in 1952.[5] This term emphasized the constant feature of necrotic fascia with the spreading of the infection along fascial planes and the non-specificity of the bacterial aetiology. The exact pathogenesis of NF has not been established yet; the release of enzymes such as hyaluronidase and proteolytic portion of cell membranes have been proved to be a cause of the necrosis.[6] The relative lack of vascularity of the relevant fascial planes has also been hypothesized as a contributing factor in NF.

Necrotizing Fasciitis affects mostly the abdominal wall, the perineum and the extremities. It is an uncommon clinical entity in the head and neck region. Dental pathology, post-traumatic or iatrogenic skin, mucosa injuries and parapharyngeal or peritonsillar infections were the most frequently described origins.[7–9] The other aetiology

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includes cervical adenitis, salivary gland infection and otological or dermal infection.[10,11]

Cervical Necrotizing Fasciitis (CNF) can develop in a different age, race and sex patient; some authors report that males are more frequently affected by CFN than women.[12] The suppressed immunity plays an important role in determining the initiation, progression, and outcomes of the disease. The mortality rate of Cervical Necrotizing Fasciitis is higher because of the tendency to spread over the mediastinum, chest and carotid sheath. The necrotizing process sometimes can expand itself using fascial planes in the neck to gain access to the mediastinum and cause a condition called "descending necrotizing mediastinitis" (DNM); this condition has a high fatality rate.

We describe a case of CNF due to neglected peritonsillar abscess, which has a fatal outcome imputable to professional malpractice.

2. Case report

A 60-year-old white man with a 14-day history of sore throat, increasing pain in right mandibular region and in right auricular region, with cervical and sub-mandibular lymphadenopathy, dysphagia, cephalalgia and odynophagia with consequent impossibility of examining throat and having fever (37.8 °C) for one day went to the Emergency Room (ER).

Two weeks before the patient's general physician ordered him oral non steroid anti-inflammatory medicament for one week. At the end of the latter the same physician treated him with oral broad-spectrum antibiotic for another week. Nevertheless, the condition of the patient worsened and he was sent to the ER. Medical examination revealed substantial swelling of his right mandibular region and in right auricular region, dysphagia and odynophagia. Computed tomography scan (CT) and chest X-rays of head were both negative. Echography of the neck showed cervical lymphadenopathy in right face (max diameter 14 mm), lymphadenopathy near submandibular salivary gland (max diameter 7 mm) and near parotid gland (max diameter 17 mm). Nothing was visualized in the left part of neck nor in the submandibular gland nor in the parotid gland nor in the level of thyroid gland. Blood test showed anaemia and leucocytosis with neutrophilia. Biochemistry results were high level of C-Reactive-Protein (CRP 341.8 mg/l). Therefore, the patient was brought to the Internal Medicine Division of the hospital.

At the time of admission he was submitted to intravenous (i.v.) antibiotic treatment (ceftriaxone bisodico) and corticosteroid treatment (betametasone). In the four following days the patient continued to suffer from sore throat, pain and swelling in the right mandibular region and in the right auricular region, dysphagia and odynophagia, fever (over 38 °C) with persistent leucocytosis and neutrophilia; clinical examination showed a red and hypertrophic right pharyngeal tonsil. During this period physicians continued the same intravenous medical therapy consisting in intra-venous antibiotic treatment and corticosteroid treatment. Four days after the admission a contrast-enhanced computerized tomography scan of the neck was performed. A widespread infective process was noticed in the right peritonsillar space that was extending until the right part of mandible; in this level a non-homogenous area (consisted of a necrotic area) was visualized.

The latter was adjacent to the vascular system and pharynx and constricted both of them. The infectious process appeared to start at the medial pterygoid muscle. The following day the patient related the secretion of a yellow–brown and malodorous fluid from his mouth and afterwards was successfully treated with metronidazole. The physical examination revealed a right latero-cervical lymphadenopathy with regional swelling, and pyrexia.

Blood results showed persistent anaemia, leucocytosis and thrombocytopenia. His condition continued to deteriorate. Six days after the recovery the patient was urgently transferred in to another hospital where he was submitted to an otolaryngology visit with a diagnosis of neck cellulitis. He was urgently admitted to the Department of Otolaryngology. Considering the condition of the patient the doctors decided to operate but he died prior to operative intervention. The legal authorities ordered the autopsy.

At an external examination the man was normal bodied, weighed 80 kg and was 170 cm tall. At autopsy a widespread suppurative process was visualized in the right peritonsillar region and in the parapharyngeal space, that was extending in the back until the pre-vertebral space and caudally to the level of the mediastinum. Greyish foul-smelling exudate and extensive tissue destruction with necrotic material was observed in the neck along the fascia posterior to the right sternocleidomastoid muscle. The right part of the platysma and right sternocleidomastoid muscles were greyish black in colour. There was necrosis of the pharyngeal mucosa of the soft palate and a fistula communicating with retro-laryngeal suppurative zone in the posterior back of the neck. Was also observed hyperplasia of Waldeyer's tonsillar ring. At the section of the windpipe and the bronchus was detected abundant pus. Except thickening of the tunica adventitia of the right common carotid and the right subclavian artery, no significative alteration was found at vessel of the neck. Microbiological factor has not been identified. The lungs showed haemorrhagic oedema. Frank pus at renal calices of right kidney was detected.

Following microscopic examination revealed typical signs of coagulation intravasal disseminate (CID) and multi-organ-failure (MOF). Basing on the clinical history and the above-mentioned results, his death was attributed to MOF due to descending mediastinitis and cervical necrotizing fasciitis caused to right peritonsillar abscess.

3. Discussion

From the above described clinical case several important medical and legal cues can be done. The latter could be examined in the penal sector, referring to professional

responsibility of the doctors of Internal Medicine Division where the patient was hospitalized.

About two weeks before the recovery in hospital, the man started to suffer from non-diagnosted tonsillitis treated with oral non-steroid anti-inflammatory medicament without results. Although this therapy the man was subject of a know and expectable complication: right peritonsillar abscess with fever, lynphadenopathy, disphagia and odynofagia. The echography of the neck performed when he arrived in the Emergency Room of the hospital, showed clearly the phlogosis in the right side of the neck with associated reactive lymphadenopathy with fever e leucocytosis. During the time of recovery the doctors treated the patient with parenteral medical therapy with FANS and broad-spectrum antibiotics. In the same period, even though the clinical condition of the patient did not show any improvement, the same therapy was continued.

The physicians neglected to perform further instrumental exams like echography, computed tomography or magnetic resonance imaging with the aim of estimating the evolution of the peritonsillar abscess and whether it was necessary submit the patient to surgical treatment.

In medical practice, is indeed well known that echography, computed tomography (CT) and magnetic resonance imaging (MRI) are useful in the diagnosis of necrotizing fasciitis. CT of the head and neck is the imaging modality of choice for several reasons.[13] It can be used if the diagnosis is uncertain or if the feasibility of surgical intervention need to be assessed. It could also explain the discrepancy between the general bad condition and the sparse local inflammation of the oral cavity, pharynx or larynx. In literature is reported that CT is of great help even in clear cases in order to discover unsuspected extensions of inflammatory process and it is essential for surgical planning, in order to determine the extent of the surgical procedure required; it should be repeated during the course of the infection.[14]

In this case, the patient was submitted to a contrast-enhanced computerized tomography scan of the neck only four days after his admission. This exam showed a widespread infective process in the right peritonsillar space extending until the right mandible with colliquative necrosis areas near vascular system and pharynx. In spite of the results of the CT the physicians continued the same medical therapy and imprudently abstained from performing surgical treatment consisting in early excision, debridement and drainage of the involved necrotic skin, fascia and muscle with administration of appropriate antibiotic therapy for prolonged times, followed by repeated surgical treatment.[15–19]

The omission of the surgical operation, which should have been done during the first days of the recovery, worsened the prognosis. The only medical therapy, though necessary, turns out to be insufficient for the therapy of peritonsillar abscess. Indeed, it is know that the key for the successful treatment of cervical necrotizing fasciitis is early diagnosis, which, when combined with aggressive treatment, can substantially improve the outcome. Many reports emphasize the importance of early recognition and aggressive surgical treatment.[20–22] This should be done early, not only to control the primary infectious process, but also to remove the necrotic tissue which is the source of secondary infection as well as of toxin production. In addition to surgical debridement, the administration of parenteral antibiotics should be instituted without delay. As the infection always exhibits a fulminant course, it is not advisable to wait for bacterial culture results. Empirical initial coverage should include broad-spectrum antibiotics which are effective against the above-mentioned pathogens. Antibiotic's coverage can be narrowed once the bacterial culture results are obtained. Furthermore, some authors proposed the use of hyperbaric oxygen as adjunctive therapy to surgery and antibiotics.[23] The worsening of the patient's initial clinical picture is due to the omission of early surgical treatment.

The infected right pharyngeal tonsil, in spite of the medical therapy worsened and developed a right peritonsillar abscess. In the absence of surgical debridement resulted in further necrotic spread, causing CNF and spread to the mediastinum, chest and carotid sheath as a descending necrotizing mediastinitis (DNM). Finally, systemically, other organs such as kidneys, lungs and hearth were affected and this lead to multiorgan failure (MOF).

4. Conclusion

Gross negligence was admitted by staff and hospital where the patient had recovered for six days.

The omission of surgical treatment with aggressive radical debridement caused the death of the patient. The complete surgical exploration and extensive drainage with appropriate medical management could have reduced the morbidity and mortality rates for cervical necrotizing fasciitis and could have prevented fatal illness like descending mediastinitis.

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